

WE CLAIM:

1. In a data-over-cable system including a plurality of network devices, a method for providing dynamic services, comprising the following steps:

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5 receiving a first message on a second network device on a data-over-cable system from a first network device on the data-over-cable system, wherein the first message includes a plurality of service parameters for a desired service for a service device associated with the first network device;

extracting the plurality of service parameters for the desired service from the first message;

10 creating a service session profile for the desired service, wherein the service session profile includes a one or more of the extracted service parameters required by the desired service, and wherein the service session profile is used by a session server associated with the data-over-cable system to activate the desired service;

15 associating the service session profile with a deferred service identifier for the first network device, wherein the deferred inactive service identifier is used to activate the desired service at a later time;

returning the deferred inactive service identifier to the first network device in a second message.

20 2. A computer readable medium having stored therein instructions for causing a central processing unit to execute the method of Claim 1.

3. The method of Claim 1 wherein the first network device is a cable modem and the second network device is a cable modem termination system.

4. The method of Claim 1 wherein the deferred inactive service identifier is a Medium
5 Access Control Protocol service identifier.

5. The method of Claim 1 wherein the service parameters include any of quality-of-service, class-of-service, type-of-service or voice service parameters.

10 6. The method of Claim 1 wherein the first message is a registration message and the second message is a registration response message.

15 7. The method of Claim 1 wherein the step of returning the deferred inactive service identifier to the first network device in a second message includes returning the deferred inactive service identifier to the first network device encoded in a Type-Length-Value format in the second message.

8. The method of Claim 1 further comprising:
receiving a service request from the first network device on the second network device to
20 activate a desired service, wherein the service request includes the deferred inactive service identifier sent to the first network device, and wherein the service request is initiated by a service device associated with the first network device;

activating the desired service on the data-over-cable system using the service session profile associated with the deferred inactive service identifier;

changing the deferred inactive service identifier into a deferred active service identifier;

and

generating a service event on a service server associated with the data-over-cable system to request activation of the desired service.

9. The method of Claim 8 wherein the service server is any of a Remote Authentication Dial In User Server, a Voice over Internet Protocol server, Asynchronous Transport Mode Server, Frame Relay Server, or an Integrated Services Digital Network server, or an Asymmetric Digital Subscriber Line server.

10. The method of Claim 8 wherein the step of generating a service event includes generating any of an authentication, authorization or an accounting event.

11. The method of Claim 1 further comprising:

receiving a service request from the first network device on the second network device to deactivate a desired service, wherein the service request includes a deferred active service identifier, and wherein the service request is initiated by a service device associated with the first network device;

deactivating the desired service on the data-over-cable system;

changing the deferred active service identifier into a deferred inactive service identifier;
and
generating a service event on a service server associated with the data-over-cable system
to request deactivation of the desired service.

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12. In a data-over-cable system including a plurality of network devices, a method for
providing dynamic services, comprising the following steps:

receiving a service request from a first network device on a second network device on a
data-over-cable system to activate a desired service, wherein the service request includes a
deferred inactive service identifier sent to the first network device by the second network device,
and wherein the service request is initiated by a service device associated with the first network
device;

activating the desired service on the data-over-cable system using a service session
profile associated with the deferred inactive service identifier created during a registration of the
first network device with the second network device;

changing the deferred inactive service identifier into a deferred active service identifier;
and
generating a service event on a service server associated with the data-over-cable system
to request activation of the desired service.

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13. A computer readable medium having stored therein instructions for causing a central
processing unit to execute the method of claim 12.

14. The method of Claim 12 wherein the first network device is a cable modem and the second network device is a cable modem termination system.

5 15. The method of Claim 12 wherein the deferred inactive service identifier is a Medium Access Control Protocol service identifier and the deferred active service identifier is a Medium Access Control Protocol Service identifier.

10 16. The method of Claim 12 wherein the service parameters include any of quality-of-service, class-of-service, type-of-service or voice service parameters.

17. The method of Claim 12 wherein the step of generating a service event includes generating any of an authentication, authorization or an accounting event.

15 18. The method of Claim 12 wherein service server is any of a Remote Authentication Dial In User Server, a Voice over Internet Protocol server, Asynchronous Transport Mode Server, Frame Relay Server, an Integrated Services Digital Network server, or an Asymmetric Digital Subscriber Line server.

20 19. The method of Claim 12 wherein the service request is a Voice over Internet Protocol offhook request.

20. In a data-over-cable system including a plurality of network devices, a method for providing dynamic services, comprising the following steps:

receiving a service request from a first network device on a second network device on a data-over-cable system to deactivate a desired service, wherein the service request includes an active service identifier, and wherein the service request is initiated by a service device associated with the first network device;

deactivating the desired service on the data-over-cable system;

changing the deferred active service identifier into a deferred inactive service identifier;

and

generating an event on a service server associated with the data-over-cable system to request deactivation of the desired service.

21. A computer readable medium having stored therein instructions for causing a central processing unit to execute the method of claim 20.

22. The method of Claim 20 wherein the deferred active service identifier is a Medium Access Control Protocol service identifier and the deferred inactive service identifier is a Medium Access Control Protocol service identifier.

23. The method of Claim 20 wherein the service request is a Voice over Internet Protocol onhook request.

24. In a data-over-cable system including a plurality of network devices, a method for providing dynamic services, comprising the following steps:

5 sending a service request from a first network device on a data-over-cable system to a second network device on the data-over-cable system to activate a deferred inactive service, wherein the service request includes an deferred inactive service identifier sent to the first network device by the second network device that is used to activate a deferred inactive service, and wherein the service request is initiated by a service device associated with the first network device; and

10 receiving a service notification from a service server associated with the second network device indicating that the deferred inactive service has been activated by the second network device.

25. A computer readable medium having stored therein instructions for causing a central processing unit to execute the methods of Claim 24.

26. In a data-over-cable system including a plurality of network devices, a method for providing dynamic services, comprising the following steps:

20 sending a service request from a first network device on a data-over-cable system to a second network device on the data-over-cable system to deactivate a desired service, wherein the service request includes an deferred active service identifier created from a deferred inactive service identifier sent to the first network device by the second network device, and wherein the service request is initiated by a service device associated with the first network device; and

receiving a service notification from a service server associated with the second network device indicating that the deferred active service has been deactivated by the second network device.

5 27. A computer readable medium having stored therein instructions for causing a central processing unit to execute the method of Claim 26.

28. A system for providing dynamic services to a network device in data-over-cable system, comprising in combination:

10 a network device for providing a desired service requested by a service device;
 a service session profile including one or more of the service parameters required for a desired service and used by a service server associated with a data-over-cable system for activating the desired service;

15 a deferred inactive service identifier associated with the service session profile for allowing activation of a desired service;

 a deferred active service identifier created from a deferred inactive service identifier for indicating that a desired service is active; and

 a service event generator for generating a service event on a service server to request a change in status of a desired service on a data-over-cable system.

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29. In a data-over-cable system including a plurality of network devices, a method for providing dynamic services, comprising the following steps:

receiving a registration message on cable modem termination system on data-over-cable system from a cable modem on the data-over-cable system, wherein the registration message
5 includes a plurality of service parameters for one or more desired services for one or more service devices associated with the cable modem;

extracting the plurality of service parameters for the one or more desired services from the registration message;

creating one or more service session profiles for the one or more desired services,
10 wherein the service session profiles include one or more of the extracted service parameters required by the one or more desired services and wherein the service session profiles are used by session servers associated with the data-over-cable system to provide the one or more desired services with required parameters;

associating the one or more service session profiles with one or more deferred inactive
15 medium access control protocol service identifiers, wherein the one or more deferred inactive medium access control protocol service identifiers are used to activate the one or more desired services at a later time; and

returning the one or more deferred inactive medium access control service identifiers to cable modem in a registration response message,

20 wherein the deferred medium access control service identifiers are used to cause activation of the one or more desired service by one or more service devices associated with the cable modem, and

wherein the deferred medium access control service identifiers are used to generate events to request a change in status in one or more desired services on one or more service servers associated with the cable modem termination system.

- 5 30. A computer readable medium having stored therein instructions for causing a central processing unit to execute the method of Claim 29.

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